Eli: Inventory Sentinel Agent.

Optimise Supply Chain & Inventory Management

Problem: Stockouts leading to lost sales, overstocking resulting in increased holding costs and waste (especially for perishables), inefficient supplier communication, lack of real-time inventory visibility across multiple locations, and manual reordering processes. Vulnerability to supply chain disruptions.

The Kuuka Solution: Implement intelligent agents that provide real-time inventory visibility, automate demand forecasting and reordering, optimize supplier selection, and streamline communication. This minimizes stockouts, reduces holding costs, and builds a more resilient and efficient supply chain.

Kuuka's Capabilities Mapping:

- **Triggers:**
    - **POS Event:** Real-time sales data from POS systems (e.g., Square) decrementing inventory.
    - **Scheduled:** Daily/weekly inventory reconciliation, demand forecasting runs.
    - **Webhook:** Supplier notifications for order confirmations, shipments, or delays.
    - **Database Change:** Updates in ERP or warehouse management systems.
- **Logic:**
    - **Condition:** `IF` (stock_level < reorder_point) or IF (predicted_demand > current_stock).
    - **Loop:** Process multiple product SKUs for reordering or stock adjustments.
    - **Switch:** Apply different reordering rules based on product category (e.g., perishable vs. non-perishable).
- **Actions:**
    - **Create PO:** Automatically generate purchase orders for suppliers.
    - **Send Email/Send SMS:** Notify procurement team of low stock, send POs to suppliers, alert managers of supply chain disruptions.
    - **Update Record:** Adjust inventory levels in real-time across all connected systems.
    - **Transform Data/Join Data:** Consolidate inventory data from multiple locations or systems for a unified view.
- **Integration:**
    - **API Call:** Connect to POS systems, ERPs (e.g., SAP, Oracle), warehouse management systems (WMS), and supplier portals.

    - **FTP/SFTP Transfer:** Exchange inventory reports or POs with suppliers who use traditional methods.

- **Advanced Features:**

    - **ML Model:** Demand forecasting, optimal reorder quantity calculation, supplier performance prediction, waste reduction alerts.
    - **Human Review:** Approval for large purchase orders or changes to critical inventory parameters.
    - **AI Assistant:** Assist in supplier selection, negotiation, or identifying alternative sourcing options.

E2E Workflow : AI-Driven Smart Replenishment & Supplier Optimisation

This workflow ensures optimal stock levels by predicting demand, automatically generating purchase orders, and selecting the best suppliers, all while maintaining human oversight for critical decisions.

1. **Trigger: Scheduled (Daily Inventory Scan)**

    - **Description:** A daily cron job (e.g., every morning at 3:00 AM) initiates a scan of all product inventory levels.
    - **Configuration:** `Example:` every day at 3 AM.

2. **Data Processing: Join Data (Inventory, Sales, & Supplier Data)**

    - **Description:** Combine current inventory levels (from POS/WMS) with historical sales data, supplier lead times, product costs, and safety stock levels.
    - **Configuration:** Join data from Square POS (current_stock), internal sales database (historical_sales), and supplier database (lead_time, cost, min_order_quantity).

3. **Logic: ML Model (Demand Forecasting)**

    - **Description:** An AI model analyses historical sales patterns, seasonality, promotional data, and external factors (e.g., local events, weather forecasts) to predict future demand for each SKU.
    - **Configuration:** Input: historical_sales, seasonality_data, promo_calendar, weather_forecast. Output: predicted_demand for next 7/14/30 days.

4. **Logic: Condition (Reorder Point Check)**

    - **Description:** Determines if the combined current stock and inbound orders are sufficient to meet predicted demand plus safety stock.
    - **Configuration:** IF (current_stock + inbound_orders < predicted_demand + safety_stock).

5. **Logic: ML Model (Supplier & Quantity Optimisation)**

    - **Description:** If a reorder is needed, another AI model identifies the optimal reorder quantity and selects the best supplier based on a weighted score (price, lead time, historical reliability, quality, minimum order quantity).
    - **Configuration:** Input: predicted_demand, supplier_data (cost, lead time, reliability score), product_data (min_order_quantity). Output: optimal_quantity, selected_supplier_id.

6. **Action: Create PO (Draft Purchase Order)**

    - **Description:** A draft Purchase Order (PO) is automatically generated based on the optimal quantity and selected supplier.
    - **Configuration:** Create PO in SME's accounting/ERP system (e.g., QuickBooks, Xero) via API Call, or generate a PDF/CSV for review.

7. **Advanced Feature: Human Review (PO Approval)**

    - **Description:** The generated PO is sent for human approval, especially for high-value orders or new suppliers.
    - **Configuration:** Notification to Procurement Manager via email/Slack with link to Kuuka dashboard for review. Approve/Reject buttons.

8. **Logic: Switch (Approval Outcome)**

    - **Description:** Workflow branches based on the approval decision.
    - **Configuration**: SWITCH (PO_Approval_Status): Approved, Rejected.

9. **Action (Approved Path): Call API (Send PO to Supplier)**

    - **Description:** If approved, the final PO is sent to the supplier's ordering system or via email.
    - **Configuration:** API Call to supplier portal or Send Email with PO attachment.

10. **Action (Rejected Path): Send Email (Internal Alert)**

    - **Description:** If rejected, an internal alert is sent to the procurement team for manual intervention and review.
    - **Configuration:** Email to: contact@mykuuka.com with rejection reason.

11. **Monitoring: Record Metric & Send Alert**

    - **Description:** Track key supply chain KPIs and alert on critical issues.
    - **Configuration:** Record Metric: Stockout Rate, Average Lead Time, Supplier On-Time Delivery Rate, Inventory Turnover. Send Alert: Critical Low Stock, Supplier Delivery Delay.

Key Business Benefits:

- **Minimised Stockouts & Overstocking:** AI-driven forecasting and automated reordering ensure optimal inventory levels, preventing lost sales and reducing holding costs.
- **Reduced Waste:** Especially critical for perishable goods, precise ordering based on demand forecasts minimizes spoilage.
- **Improved Supplier Relationships:** Streamlined PO generation and communication lead to more efficient interactions.
- **Cost Savings:** Optimised supplier selection based on price and reliability, coupled with reduced manual effort, drives down procurement costs.
- **Enhanced Supply Chain Resilience:** Real time visibility and proactive alerts enable quicker responses to disruptions.
- **Better Cash Flow:** Reduced inventory holding costs and optimised payment terms contribute to healthier cash flow.